

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 09-267424

(43)Date of publication of application : 14.10.1997

(51)Int.Cl.

B32B 7/06
B32B 7/14
F21V 8/00
G02B 5/02
G02B 5/08
G02F 1/1335
G09F 9/00

(21)Application number : 08-080257

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(22)Date of filing : 02.04.1996

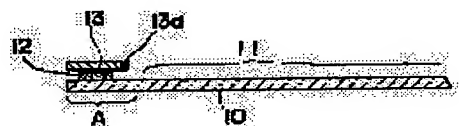
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(54) SHEET MEMBER FOR SURFACE LIGHT SOURCE DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To facilitate sheet member fixing work at the time of the production of a surface light source device and to enhance fixing accuracy.

SOLUTION: In this sheet member 10 transmitting and reflecting light in a surface light source device, a strip like self-adhesive layer 12 is formed to the part A on the side of the end part excepting the effective surface part transmitting and reflecting light of the sheet surface along the end edge thereof. Release paper 13 having an area larger than that of the strip like self-adhesive layer 12 is bonded to the self-adhesive layer 12 in a releasable manner so as to cover the self-adhesive layer 12.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision
of rejection]

[Date of requesting appeal against examiner's
decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] the sheet to which transparency, reflection, etc. carry out light in surface light source equipment — the sheet for surface light source equipments characterized by to have formed the band-like adhesive layer along with the edge, to have stuck the releasing paper with a bigger area than the above-mentioned band-like one possible [ablation] on this adhesive layer, and to cover an adhesive layer into the portion by the side of the edge except the measuring-area portion to which it is a member and light carries out transparency, reflection, etc. in a sheet side — a member

[Claim 2] the sheet for surface light source equipments according to claim 1 with which the adhesive layer is formed of screen-stencil — a member

[Claim 3] the sheet for surface light source equipments according to claim 1 or 2 it is 1.1 to 20 times whose area of the releasing paper to a band-like adhesive layer of this — a member

[Claim 4] the sheet for surface light source equipments given in any 1 term of the claims 1-3 whose sheet members are a reflective sheet, a diffusion sheet, or a condensing sheet — a member

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the sheet member for surface light source equipments used for various surface light source equipments, such as a back light of a liquid crystal display, a lighting display, and a lighting object.

[0002]

[Description of the Prior Art] From the former, the back light to which the thin shape display which uses liquid crystal, such as a personal computer, a word processor, and a liquid crystal television, irradiates this liquid crystal display screen from a rear-face side since the liquid crystal itself does not emit light is used. Since it says that thin-shape-izing of the display itself and miniaturization are possible as such a back light, the surface light source equipment of the edge light type which installed the light source in the end-face section of a light guide plate is adopted.

[0003] As this edge light type of surface light source equipment is shown in drawing 3, a light guide plate 21, The light source 20 arranged in the unilateral end face of this light guide plate 21, and the reflective sheet 22 made to reflect the light which it is arranged in the rear-face side of the above-mentioned light guide plate 21, and is going to carry out outgoing radiation from the rear face of this light guide plate 21, It consists of a diffusion sheet 24 which diffuses the light by which outgoing radiation is carried out from the optical outgoing radiation side of the above-mentioned light guide plate 21, and a condensing sheet 23 which brings together the light which penetrated this diffusion sheet 24 in a part for the core of the surface light source, and raises transverse-plane brightness. Thus, it is made to control the optical path of the light which carries out outgoing radiation from the optical outgoing radiation side of a light guide plate 21 by using the diffusion sheet 24 and the condensing sheet 23. moreover, each sheet of the above-mentioned reflective sheet 22, the diffusion sheet 24, and the condensing sheet 23 — between members, in order to heighten an optical spreading effect etc. using the difference of a refractive index with air, the air space 25 is formed In drawing 3, 27 is reflective covering which reflects the light from the light source.

[0004] the above-mentioned surface light source equipment — the time of an assembly — each sheet member of a light guide plate 21, the reflective sheet 22 and the diffusion sheet 24, and the condensing sheet 23 — positioning — the times, such as handling, — each sheet — a member — comrades shift and there are problems, like assembly precision becomes bad then, each sheet — a member — in order to prevent that comrades shift and to raise productivity — each sheet — a member — it is desirable to fix comrades in the state of accumulation

[0005] thus, each sheet — a member — while maintaining an air space 25 in between — a sheet — a member — the portion by the side of the edge which produces each sheet member greatly a little rather than the measuring-area portion to which light carries out transparency etc., and protrudes the above-mentioned measuring-area portion since comrades are fixed (A in drawing 3) — using — each sheet — a member — fixing comrades is performed

[0006] each sheet — as a method of fixing the portion A by the side of the above-mentioned edge of a member, various kinds of methods, such as the heat-sealing method, an adhesives

method, and a binder method, are raised the method of using also in these the double-sided pressure sensitive adhesive sheet which put the releasing paper on the adhesive face of a binder sheet — before assembly processing — each sheet — it is carried out noting that it is possible to fix a member, working hours are short, repair of a position gap etc. is easy working hours and it is the method which was excellent as compared with other methods and it is shown in drawing 3 — as — the adhesive layer 26 of a double-sided pressure sensitive adhesive sheet — minding — each sheet — a member — comrades are fixed

[0007] each sheet by the above double-sided pressure sensitive adhesive sheets — fixation of a member is performed as follows namely, the adhesive face which cut the double-sided pressure sensitive adhesive sheet to band-like [of predetermined width of face], carried out ablation removal of the releasing paper of one side first, was made to expose an adhesive face, and was exposed on this one side — a sheet — it sticks on the portion A by the side of the edge of a member subsequently, ablation removal of the releasing paper of the other sides of the double-sided pressure sensitive adhesive sheet stuck on the sheet member is carried out, and an adhesive face is exposed — making — other sheets — the sheet with which it stuck on the portion A by the side of the edge of a member, and this double-sided pressure sensitive adhesive sheet was stuck — a member — sticking comrades and fixing is performed

[0008] [Problem(s) to be Solved by the Invention] However, by the above-mentioned method, since the double-sided pressure sensitive adhesive sheet cut by predetermined width of face is used, the width of face of a binder and a releasing paper and area are the same, and must carry out ablation removal only of the releasing paper from the state. For this reason, in case a releasing paper is removed, the corner of a releasing paper etc. is hooked on tiptoe etc., a few is removed, and it must be made to have to tear off gradually on both sides of this minute ablation portion on tiptoe etc. thus, making the cause of ablation — difficult — troublesome — a sheet — a member — there is a problem that the workability of the fixed work of comrades is very bad, and it had also become the cause of cost raising

[0009] On the other hand, the latest surface light source equipment is wanted to make as small as possible area of the portion which is not effective in transparency of light etc. with the miniaturization of the various devices by which surface light source equipment is used, and lightweight-izing. therefore, each sheet which used a double-sided pressure sensitive adhesive sheet which was mentioned above — a member — while it is small as much as possible and forming the area of the portion A by the side of an edge in narrow in fixation of comrades, it is desirable to also make cutting width of face of a double-sided pressure sensitive adhesive sheet as narrow as possible, and to narrow width of face of an adhesive layer 26 However, it being narrow and cutting the width of face of a double-sided pressure sensitive adhesive sheet with a sufficient precision moreover has the problem that it is difficult and weaving and sheet pieces occur frequently at the time of cutting. and a double-sided pressure sensitive adhesive sheet with such narrow width of face — a sheet — it is also very difficult for the portion A by the side of the edge of a member to stick with a sufficient precision Therefore, there is a limitation in narrow-ization of a double-sided pressure sensitive adhesive sheet, and the limitation had arisen also in the miniaturization of surface light source equipment itself.

[0010] that by which this invention was made in view of such a situation — it is — the sheet at the time of manufacture of surface light source equipment — the fixed work of a member — carrying out — being easy — the sheet for surface light source equipments which can moreover raise fixed precision — offer of a member is set as the purpose

[0011]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the sheet member for surface light source equipments of this invention the sheet to which transparency, reflection, etc. carry out light in surface light source equipment — into the portion by the side of the edge except the measuring-area portion to which it is a member and light carries out transparency, reflection, etc. in a sheet side Let it be a summary to have formed the band-like adhesive layer along with the edge, to have stuck the releasing paper with a bigger area than the above-mentioned band-like one possible [ablation] on this adhesive layer, and to have covered

the adhesive layer.

[0012] That is, this invention forms a band-like adhesive layer in the portion by the side of the edge of a sheet side along with the edge, and is sticking the releasing paper with a bigger area than the above-mentioned band-like one possible [ablation] on this adhesive layer. Therefore, an adhesive layer is made as for the portion which is not stuck to a binder to a wrap releasing paper. And in the case of releasing-paper removal, a releasing paper can be removed now very easily by gathering and tearing off with a finger taking advantage of the portion which has not carried out [above-mentioned] adhesion. for this reason, the sheet at the time of assembling surface light source equipment — a member — the workability of the fixed work of comrades can be markedly alike, and can improve, and reduction of assembly cost etc. can be aimed at

[0013] Moreover, when an adhesive layer is formed by screen-stencil, it can be narrow and the band-like width-of-face size of an adhesive layer can be made to form with a sufficient precision in this invention. For this reason, it can be small as much as possible, the area of the portion A by the side of an edge can be formed in narrow, it can become possible to make small area of the portion which is not effective in transparency of the light of a sheet side etc., and the miniaturization of surface light source equipment itself can be realized now.

[0014]

[Embodiments of the Invention] Below, the gestalt of operation of this invention is explained in detail.

[0015] Drawing 1 shows the sheet member for surface light source equipments of this invention. namely, a sheet — the light of a member 10 has formed the band-like adhesive layer 12 in the portion A by the side of the edge except the measuring-area portion 11 which carries out transparency etc. And it is made to cover this adhesive layer 12 top by the releasing paper 13 with a bigger area than the above-mentioned band-like one. Partial 13a which has not been stuck to a binder where the above-mentioned releasing paper 13 is stuck on an adhesive layer 12 is formed.

[0016] the above-mentioned sheet — as a member 10, a reflective sheet, a diffusion sheet, and a condensing sheet are used

[0017] If the light which penetrated the light guide plate is efficiently reflected as a reflective sheet, various kinds of things will be used. For example, porosity polyester film, a porosity polyolefine film, etc. are raised. As this reflective sheet, the thing of 90% or more of reflection factors is desirable.

[0018] As a diffusion sheet, the transparent resin sheet which consists of a polyethylene terephthalate, a polycarbonate, polystyrene, acrylic resin, methacrylic resin, etc. is used. Various kinds of porosity sheets which made these transparent resin sheet porosity, the sheet which performed concavo-convex processing to the front face of a transparent resin sheet by sandblasting, solvent processing, etc., the sheet in which the diffusion layer which made the transparent resin base diffuse particles, such as a resin bead, was formed on the front face, etc., If the light to penetrate is scattered and you make it spread, various kinds of things will be used. As this diffusion sheet, the thing of 80% or more of light transmittances and 80% or more of Hayes values is desirable.

[0019] As a condensing sheet, it consists of a transparent resin, and if many protruding lines of the shape of prism or the letter of a wave are put in order and formed in a sheet side or it has the function to bring together the light which forms and penetrates much salients of the shape of the shape of a semi-sphere, or a pyramid in a center section, various kinds of things will be used and it will not limit especially.

[0020] As a binder which forms an adhesive layer, acrylic-acid (meta) alkyl ester, such as n-butyl (meta) acrylate, 2-ethylhexyl (meta) acrylate, iso octyl (meta) acrylate, and iso nonyl (meta) acrylate, The acrylic binder which makes copolymers, such as an acrylic acid and an itaconic acid, a principal component, (Meta) Various rubber system binders, such as a natural rubber system, a styrene-butadiene-random copolymerization system, a styrene-isoprene-styrene block system, a styrene-butadiene-styrene block system, a styrene-ethylene-butylene-styrene block system, an isobutylene-isoprene-rubber system, and a polyisobutylene system, Although various vinyl system binders, such as various silicone system binders and a vinyl

acetate system, etc. are raised, it does not limit especially and various kinds of things are used. Also in these, the acrylic binder is excellent from a heat-resistant viewpoint. Moreover, in order to make these binders reduce the brightness unevenness which happens by reflection of the light in an edge, they are made to contain the pigment which absorbs light and you may make it color it them. The need is accepted at these binders. Furthermore, various tackifiers, such as a rosin system, a chroman-indene system, a terpene system, a petroleum system, a styrene system, a phenol system, and a xylene system, Softeners, such as polybdenum, poly ISOFUCHIREN, a polyisoprene, a process oil, and naphthene oil, Various cross linking agents, such as various bulking agents, such as antioxidants, such as a phenol system and an amine system, an ultraviolet ray absorbent, a titanium white, a zinc white, a calcium carbonate, clay, talc, and carbon, a thiuram system, a phenol system, and an isocyanate system, etc. can also be blended.

[0021] The application of the binder to each above-mentioned sheet member is performed most suitably [screen printing] also in these, although various kinds of methods, such as an application by screen printing and the fixed quantity **** gun, the brush applying method, and a replica method, are performed. According to the above-mentioned screen printing, it can be narrow, and moreover the band-like width of face of an adhesive layer can be made to form with a sufficient precision, and also there is an advantage that control of thickness is easy. As an application pattern of a binder in this case, it is not limited especially that what is necessary is just to apply by various kinds of patterns, such as the shape of the shape of a line and a dotted line, and a dot.

[0022] As a releasing paper, similarly, various kinds of things, such as plastic film which performed lamination, such as silicone resin and a fluororesin, and paper which performed coating processing and lamination to the front face, are used, and it does not limit to a front face especially. Especially as thickness of a releasing paper, although it does not limit, the viewpoint of the ease of dealing with it to about 10–100 micrometers are desirable.

[0023] Its about 1.1 to 20 times are desirable, and if the area of the releasing paper to a binder application side is about 2 to 15 times, it is still more desirable. That is, in less than 1.1 times, in case a releasing paper is exfoliated, the area of the binder used as the cause of ablation and the portion which has not been stuck is too small, and improvement in workability cannot be desired. On the other hand, when 20 times are exceeded, a binder and the area of the releasing paper of the portion which has not been stuck are too large, in case it is handling, when not expecting, a releasing paper separates, or it shifts and there is a problem that handling becomes difficulty.

[0024] The sheet member for surface light source equipments of this invention can be manufactured as follows, for example. That is, sheet members, such as a reflective sheet, a diffusion sheet, and a condensing sheet, are prepared first. subsequently, these sheets — along with the edge, a band-like adhesive layer is formed in the portion A by the side of the edge except the measuring-area portion to which light carries out transparency, reflection, etc. in the sheet side of a member with screen printing Next a releasing paper with a bigger area than the upper shell of this adhesive layer and the above-mentioned band-like adhesive layer is stuck, and it is a wrap about an adhesive layer.

[0025] Surface light source equipment can be assembled as follows using the sheet member for surface light source equipments of the above-mentioned composition. namely, — first — a sheet — the adhesive layer 12 of the releasing paper 13 of a member and partial 13a which has not been stuck are gathered with a finger, and it pulls up taking advantage of this portion, it tears off from the front face of an adhesive layer 12, and the adhesive face of an adhesive layer 12 is made to expose Subsequently, each sheet member (a reflective sheet, a diffusion sheet, condensing sheet) by which the adhesive face was exposed, and a light guide plate are prepared in this way, accumulation fixation of the reflective sheet is carried out with the adhesion of the above-mentioned adhesive face at the rear-face side of a light guide plate, and accumulation fixation of a diffusion sheet and the condensing sheet is carried out with the adhesion of an adhesive face at the front-face side of the light guide plate. Thereby, accumulation fixation of a light guide plate and each sheet member (a reflective sheet, a diffusion sheet, condensing sheet) is carried out, and, moreover, an air space is formed between each part material. The light

source is attached in this and surface light source equipment is assembled (refer to drawing 3).
[0026]

[Effect of the Invention] As mentioned above, according to the sheet member for surface light source equipments of this invention, an adhesive layer is made as for the portion which is not stuck to a binder to a wrap releasing paper. And in the case of releasing-paper removal, a releasing paper can be removed now very easily by gathering and tearing off with a finger taking advantage of the portion which has not carried out [above-mentioned] adhesion. for this reason, the sheet at the time of assembling surface light source equipment — a member — the workability of the fixed work of comrades can be markedly alike, and can improve, and reduction of assembly cost etc. can be aimed at

[0027] Moreover, when an adhesive layer is formed by screen-stencil, it can be narrow and the band-like width-of-face size of an adhesive layer can be made to form with a sufficient precision in this invention. For this reason, it can be small as much as possible, the area of the portion by the side of an edge can be formed in narrow, it can become possible to make small area of the portion which is not effective in transparency of the light of a sheet side etc., and the miniaturization of surface light source equipment itself can be realized now.

[0028] Below, it combines with the example of comparison and an example is explained.

[0029]

[Example] The example which applied the sheet member for surface light source equipments of this invention to the reflective sheet is shown.

[0030] As a reflective sheet, the porosity sheet of 96% of reflection factors and 30% of porosity which consists of a polyethylene resin with a thickness of 150 micrometers was used. The above-mentioned reflective sheet was cut in the predetermined size (170mmx230mm), and was set to the screen-stencil machine, printed by width of face of 1.5mm, and put in an acrylic pressure sensitive adhesive into a dryer further, the edge of the above-mentioned reflective sheet was made to dry it as a binder, the solvent was removed, and the adhesive layer was made to form. As a releasing paper, using what gave silicone resin processing to polyester film with a thickness of 25 micrometers, it piled up and what was cut in width of face of 5mm was stuck so that all the above-mentioned adhesive layers might be covered. Subsequently, in order to process into a predetermined configuration the film which stuck the above-mentioned releasing paper, it was processed by having used and pierced a Thompson style punching type, and the reflective sheet was obtained.

[0031]

[The example 1 of comparison] Using the double-sided tape which comes to lay the releasing paper which gave the acrylic pressure sensitive adhesive to the one side, and gave silicone resin processing to paper with a thickness of 50 micrometers on top of both sides of polyester film with a thickness of 25 micrometers, this double-sided tape was cut to 2.5mm width of face using the slitter formula cutting machine, and it stuck on the edge of the porosity sheet which used this in the example. Subsequently, the same punching processing as an example was performed, and the reflective sheet was obtained.

[0032] Next, precision of the assembly workability and adhesive layer of each reflective sheet of the above-mentioned example and the example 1 of comparison was measured.

[0033] Assembly workability did the work which carries out ablation removal, piles up the releasing paper of each reflective sheet, and is fixed on this light guide plate using the light guide plate with a thickness of 2.5mm made of acrylic resin, and evaluated the number which was able to carry out fixed processing of the one worker per unit time on the basis of the example 1 of comparison.

[0034] The precision of an adhesive layer measured the maximum width (W2 in drawing 2) of the appearance containing the wave of the adhesive layer of 150mm length, and the actual width of face (W1 in drawing 2) when not taking a wave into consideration, and evaluated them by the difference (W2-W1).

[0035] The evaluation result of the above-mentioned assembly workability and the precision of an adhesive layer is shown in the following table 1.

[0036]

[Table 1]

	組み立て作業性	粘着層の精度 (mm)
実施例	1. 8	0. 1
比較例 1	1	0. 4

[0037] In the example, there is much assembly number per unit time, and the above-mentioned table 1 shows that workability is improving. In addition, in the example 1 of comparison, the removal was difficult to removal of a releasing paper having been very easy for in the example at the time of this assembly work. Moreover, in the example, it turns out that the precision of an adhesive layer is also improving compared with the example 1 of comparison.

[0038]

[The example 2 of comparison] Setting cutting width of face of a double-sided tape to 1.5mm, others tried with how to obtain a reflective sheet like the example 1 of comparison. However, cutting width of face was too narrow, at the time of cutting of a double-sided tape, weaving and the sheet piece were able to be generated, the double-sided tape which precision improved cutting processing by 1.5mm width of face could not be obtained, and a reflective sheet with the narrow width of face of an adhesive layer was not able to be obtained as a result. On the other hand, in the example, the reflective sheet with the narrow width of face of an adhesive layer with a width of face of 1.5mm is obtained as mentioned above.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the cross section showing the sheet member for surface light source equipments of this invention.

[Drawing 2] It is explanatory drawing showing the sheet member for surface light source equipments of this invention.

[Drawing 3] It is the cross section showing surface light source equipment.

[Description of Notations]

10 Sheet — Member

11 Measuring-Area Portion

12 Adhesive Layer

13 Releasing Paper

A The portion by the side of an edge

[Translation done.]

(19) 日本国特許庁 (J P)

(12) 公 開 特 許 公 報 (A)

(11) 特許出願公開番号

特開平9-267424

(43) 公開日 平成9年(1997)10月14日

(51) Int.Cl. ⁶	識別記号	庁内整理番号	F I	技術表示箇所
B 3 2 B 7/06			B 3 2 B 7/06	
			7/14	
F 2 1 V 8/00	6 0 1		F 2 1 V 8/00	6 0 1 E
G 0 2 B 5/02			G 0 2 B 5/02	B
			5/08	

審査請求 未請求 請求項の数 4 O L (全 6 頁) 最終頁に続く

(21) 出願番号 特願平8-80257

(22) 出願日 平成8年(1996)4月2日

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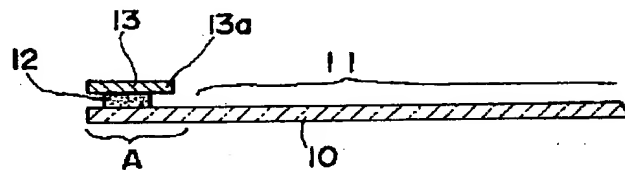
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(54) 【発明の名称】 面光源装置用シート部材

(57) 【要約】

【課題】 面光源装置の製造時のシート部材の固定作業がしやすくなり、しかも固定精度を向上させることができる面光源装置用シート部材を提供する。

【解決手段】 面光源装置において光を透過、反射等させるシート部材10であって、シート面において光が透過、反射等する有効面部分を除いた端部側の部分Aに、端縁に沿って帯状の粘着層12を形成し、この粘着層12の上に、上記帯状よりも面積が大きな剥離紙13を剥離可能に貼着して粘着層12を覆うようにしている。



10: シート部材

11: 有効面部分

12: 粘着層

13: 剥離紙

A: 端部側の部分

(2)

【特許請求の範囲】

【請求項1】 面光源装置において光を透過、反射等させるシート部材であって、シート面において光が透過、反射等する有効面部分を除いた端部側の部分に、端縁に沿って帯状の粘着層を形成し、この粘着層の上に、上記帯状よりも面積が大きな剥離紙を剥離可能に貼着して粘着層を覆ったことを特徴とする面光源装置用シート部材。

【請求項2】 粘着層がスクリーン印刷により形成されている請求項1記載の面光源装置用シート部材。

【請求項3】 帯状の粘着層に対する剥離紙の面積が、1. 1～20倍である請求項1または2記載の面光源装置用シート部材。

【請求項4】 シート部材が、反射シート、拡散シート、集光シートのいずれかである請求項1～3のいずれか一項に記載の面光源装置用シート部材。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、液晶ディスプレイのバックライト、照明ディスプレイ、照明体等の各種面光源装置に使用される面光源装置用シート部材に関するものである。

【0002】

【従来の技術】従来から、パソコン、ワープロ、液晶テレビ等のような液晶を使用する薄型表示装置は、液晶自体が発光しないため、この液晶表示画面を裏面側から照射するバックライトが使用されている。このようなバックライトとしては、表示装置自体の薄型化、コンパクト化が可能であるという理由から、導光板の端面部に光源を設置したエッジライトタイプの面光源装置が採用されている。

【0003】このエッジライトタイプの面光源装置は、図3に示すように、導光板21と、この導光板21の一侧端面に配設される光源20と、上記導光板21の裏面側に配設されこの導光板21の裏面から出射しようとする光を反射させる反射シート22と、上記導光板21の光出射面から出射される光を拡散させる拡散シート24と、この拡散シート24を透過した光を面光源の中心部分に集めて正面輝度を高める集光シート23とから構成されている。このように、拡散シート24および集光シート23を使用することにより、導光板21の光出射面から出射する光の光路をコントロールをするようにしている。また、上記反射シート22、拡散シート24、集光シート23の各シート部材の間には、空気との屈折率の差を利用して光拡散効果等を高めるようにするため、空気層25が設けられている。図3において、27は光源からの光を反射する反射カバーである。

【0004】上記面光源装置では、組み立ての際に、導光板21と、反射シート22、拡散シート24、集光シート23の各シート部材を位置決めし、ハンドリング等

の際に各シート部材同士がずれてしまい、組み立て精度が悪くなる等の問題がある。そこで、各シート部材同士がずれるのを防止して生産性を向上させるため、各シート部材同士を積重状態で固定しておくのが望ましい。

【0005】このように、各シート部材間に空気層25を維持しながらシート部材同士を固定するために、各シート部材を光が透過等する有効面部分よりも若干大きく作製し、上記有効面部分をはみ出す端部側の部分（図3におけるA）を利用して各シート部材同士を固定することが行われている。

【0006】各シート部材の上記端部側の部分Aを固定する方法としては、ヒートシール法、接着剤法、粘着剤法等の各種の方法があげられる。これらの中でも、粘着剤シートの粘着面に剥離紙を重ねた両面粘着シートを使用する方法は、組み立て加工前に、各シート部材の固定を行うことが可能であり、作業時間が短く、位置ずれの手直し等も容易であり、他法に比較して優れた方法であるとして行われている。そして、図3に示すように、両面粘着シートの粘着層26を介して各シート部材同士が固定される。

【0007】上記のような両面粘着シートによる各シート部材の固定はつぎのようにして行われる。すなわち、まず、両面粘着シートを所定幅の帯状に切断し、片面の剥離紙を剥離除去して粘着面を露呈させ、この片面に露呈した粘着面を、シート部材の端部側の部分Aに貼り付ける。ついで、シート部材に貼り付けられた両面粘着シートの他面の剥離紙を剥離除去して粘着面を露呈させ、他のシート部材の端部側の部分Aに貼り付け、この両面粘着シートが貼着されたシート部材同士を貼り合わせて固定することが行われる。

【0008】

【発明が解決しようとする課題】しかしながら、上記の方法では、所定幅に切断された両面粘着シートを使用することから、粘着剤と剥離紙との幅、面積が同じであり、その状態から剥離紙だけを剥離除去しなければならぬ。このため、剥離紙を除去する際に、剥離紙の角部等を爪先等で引っ掛けて少し剥がし、この微小剥離部分を爪先等で挟んで徐々に引き剥がすようにしなければならない。このように、剥離のきっかけを作るのが困難で煩わしく、シート部材同士の固定作業の作業性が極めて悪いという問題があり、コスト引き上げの原因にもなっていた。

【0009】一方、最近の面光源装置は、面光源装置が使用される各種機器の小型化、軽量化にともない、光の透過等に有効でない部分の面積をできるだけ小さくすることが望まれている。したがって、上述したような、両面粘着シートを使用した各シート部材同士の固定にあたっては、端部側の部分Aの面積をできるだけ小さく、幅狭に形成するとともに、両面粘着シートの切断幅もできるだけ狭くし、粘着層26の幅を狭くすることが望まし

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い。しかしながら、両面粘着シートの幅を狭く、しかも精度よく切断することは困難で、切断時に巻きずれやシート切れが多発するという問題がある。しかも、このような幅の狭い両面粘着シートをシート部材の端部側の部分Aに精度よく貼り付けることも極めて困難である。したがって、両面粘着シートの幅狭化には限界があり、面光源装置自体の小型化にも限界が生じていた。

【0010】本発明は、このような事情に鑑みなされたもので、面光源装置の製造時のシート部材の固定作業がしやすくなり、しかも固定精度を向上させることができる面光源装置用シート部材の提供をその目的とする。

【0011】

【課題を解決するための手段】上記の目的を達成するため、本発明の面光源装置用シート部材は、面光源装置において光を透過、反射等させるシート部材であって、シート面において光が透過、反射等する有効面部分を除いた端部側の部分に、端縁に沿って帯状の粘着層を形成し、この粘着層の上に、上記帯状よりも面積が大きな剥離紙を剥離可能に貼着して粘着層を覆ったことを要旨とする。

【0012】すなわち、本発明は、シート面の端部側の部分に端縁に沿って帯状の粘着層を形成し、この粘着層の上に、上記帯状よりも面積が大きな剥離紙を剥離可能に貼着している。したがって、粘着層を覆う剥離紙に、粘着剤に密着しない部分ができる。そして、剥離紙除去の際には、上記密着していない部分をきっかけとして手指で摘み、引き剥がすことで、極めて容易に剥離紙を除去することができるようになる。このため、面光源装置を組み立てる際のシート部材同士の固定作業の作業性が格段に向上し、組み立てコストの低減等を図ることができる。

【0013】また、本発明において、粘着層をスクリーン印刷により形成した場合には、粘着層の帯状の幅寸法を狭く、しかも精度よく形成させることができる。このため、端部側の部分Aの面積をできるだけ小さく、幅狭に形成し、シート面の光の透過等に有効でない部分の面積を小さくすることが可能となり、面光源装置自体の小型化を実現することができるようになる。

【0014】

【発明の実施の形態】つぎに、本発明の実施の形態を詳しく説明する。

【0015】図1は、本発明の面光源装置用シート部材を示す。すなわち、シート部材10の、光が透過等する有効面部分11を除く端部側の部分Aに、帯状の粘着層12を設けている。そして、この粘着層12の上を、上記帯状よりも面積の大きな剥離紙13で覆うようにしている。上記剥離紙13は、粘着層12上に貼着された状態で粘着剤に密着していない部分13aが形成されている。

【0016】上記シート部材10としては、反射シ

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ト、拡散シート、集光シートが用いられる。

【0017】反射シートとしては、導光板を透過した光を効率よく反射させるものであれば、各種のものが用いられる。例えば、多孔質ポリエステルフィルム、多孔質ポリオレフィンフィルム等があげられる。この反射シートとしては、反射率90%以上のものが好ましい。

【0018】拡散シートとしては、ポリエチレンテレフタレート、ポリカーボネート、ポリスチレン、アクリル樹脂、メタクリル樹脂等からなる透明樹脂シートを用い、これら透明樹脂シートを多孔質にした各種の多孔質シート、透明樹脂シートの表面にサンドブラスト、溶剤処理等で凹凸処理を施したシート、透明樹脂ベースに樹脂ビーズ等の微粒子を拡散させた拡散層を表面に形成したシート等、透過する光を散乱させて拡散させるものであれば各種のものが用いられる。この拡散シートとしては、光透過率80%以上、ヘイズ値80%以上のものが好ましい。

【0019】集光シートとしては、透明樹脂からなり、シート面に、プリズム状やウエーブ状の凸条を多数並べて形成したり、半球状やピラミッド状の突起を多数形成したものであり、透過する光を中央部に集める機能を有するものであれば、各種のものが用いられ、特に限定するものではない。

【0020】粘着層を形成する粘着剤としては、n-ブチル(メタ)アクリレート、2-エチルヘキシル(メタ)アクリレート、イソオクチル(メタ)アクリレート、イソノニル(メタ)アクリレート等の(メタ)アクリル酸アルキルエステルと、(メタ)アクリル酸、イタコン酸等のコポリマーを主成分とするアクリル系粘着剤、天然ゴム系、スチレン-ブタジエン-ランダム共重合体系、スチレン-イソブレン-スチレンブロック系、スチレン-ブタジエン-スチレンブロック系、スチレン-エチレン-ブチレン-スチレンブロック系、ブチルゴム系、ポリイソブチレン系等の各種ゴム系粘着剤、各種シリコン系粘着剤、酢酸ビニル系等の各種ビニル系粘着剤等があげられるが、特に限定するものではなく、各種のものが用いられる。これらのなかでも、耐熱性の観点から、特にアクリル系粘着剤が優れている。また、これらの粘着剤には、端部での光の反射によって起こる輝度むらを低減させるため、光を吸収する顔料等を含有させて着色するようにしてもよい。さらに、これらの粘着剤には、必要に応じてロジン系、クロマノーインデン系、テルペン系、石油系、スチレン系、フェノール系、キシレン系等の各種粘着付与剤、ポリブデン、ポリイソブチレン、ポリイソブレン、プロセスオイル、ナフテン系オイル等の軟化剤、フェノール系、アミン系等の老化防止剤、紫外線吸収剤、チタン白、亜鉛華、炭カル、クレー、タルク、カーボン等の各種充填剤、チウラム系、フェノール系、イソシアネート系等の各種架橋剤等を配合することもできる。

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【0021】上記各シート部材への粘着剤の塗布は、スクリーン印刷法、定量吐出ガンによる塗布、刷毛ぬり法、転写法等各種の方法が行われるが、これらのなかでも、スクリーン印刷法が最も好適に行われる。上記スクリーン印刷法によれば、粘着層の帯状の幅を狭く、しかも精度よく形成させることができるほか、厚みのコントロールが容易であるという利点がある。この場合の、粘着剤の塗布パターンとしては、線状、点線状、ドット状等各種のパターンで塗布すればよく、特に限定されるものではない。

【0022】剥離紙としては、表面にシリコーン樹脂、フッ素樹脂等のラミネート加工を施したプラスチックフィルムや、同じく表面にコーティング加工やラミネート加工を施した紙等各種のものが用いられ、特に限定するものではない。剥離紙の厚みとしては、特に限定するものではないが、取扱いやすさの観点から、10～100 μm 程度が好ましい。

【0023】粘着剤塗布面に対する剥離紙の面積は、1. 1～20倍程度が好ましく、2～15倍程度であればさらに好ましい。すなわち、1. 1倍未満では、剥離紙を剥離する際に、剥離のきっかけとなる粘着剤と密着していない部分の面積が小さすぎ、作業性の向上が望めない。一方、20倍を超えると、粘着剤と密着していない部分の剥離紙の面積が大きすぎ、取扱の際に、予期しない時に剥離紙が剥がれたり、ずれたりし、取扱いが困難になるという問題がある。

【0024】本発明の面光源装置用シート部材は、例えば、つぎのようにして製作することができる。すなわち、まず、反射シート、拡散シート、集光シート等のシート部材を準備する。ついで、これらシート部材の、シート面において光が透過、反射等する有効面部分を除いた端部側の部分Aに、スクリーン印刷法により、端縁に沿って帯状の粘着層を形成する。つぎに、この粘着層の上から、上記帯状の粘着層よりも面積が大きな剥離紙を貼着して粘着層を覆う。

【0025】上記構成の面光源装置用シート部材を用いて、面光源装置は、つぎのようにして組み立てることができる。すなわち、まず、シート部材の剥離紙13の、粘着層12と密着していない部分13aを手指で摘み、この部分をきっかけとして上方に引っ張り、粘着層12の表面から引き剥がして粘着層12の粘着面を露呈させる。ついで、このように、粘着面が露呈された各シート部材（反射シート、拡散シート、集光シート）と、導光板とを準備し、導光板の裏面側に反射シートを、上記粘着面の粘着力により積重固定し、その導光板の表面側に、拡散シートおよび集光シートを粘着面の粘着力により積重固定する。これにより、導光板と各シート部材（反射シート、拡散シート、集光シート）が積重固定され、しかも各部材間に空気層が形成される。これに光源を取り付けて面光源装置が組み立てられる（図3参

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照）。

【0026】

【発明の効果】以上のように、本発明の面光源装置用シート部材によれば、粘着層を覆う剥離紙に、粘着剤に密着しない部分ができる。そして、剥離紙除去の際には、上記密着していない部分をきっかけとして手指で摘み、引き剥がすことで、極めて容易に剥離紙を除去することができるようになる。このため、面光源装置を組み立てる際のシート部材同士の固定作業の作業性が格段に向上し、組み立てコストの低減等を図ることができる。

【0027】また、本発明において、粘着層をスクリーン印刷により形成した場合には、粘着層の帯状の幅寸法を狭く、しかも精度よく形成させることができる。このため、端部側の部分の面積をできるだけ小さく、幅狭に形成し、シート面の光の透過等に有効でない部分の面積を小さくすることが可能となり、面光源装置自体の小型化を実現することができるようになる。

【0028】つぎに、実施例について比較例と併せて説明する。

【0029】

【実施例】本発明の面光源装置用シート部材を反射シートに適用した例を示す。

【0030】反射シートとして、反射率96%、厚み150 μm のポリエチレン樹脂からなる気孔率30%の多孔質シートを用いた。上記反射シートを、所定寸法（170mm×230mm）に切断し、スクリーン印刷機にセットし、粘着剤としてアクリル系感圧接着剤を、上記反射シートの端部に、幅1.5mmで印刷し、さらに乾燥機中に入れて乾燥させて溶剤を除去し、粘着層を形成させた。剥離紙として、厚さ25 μm のポリエステルフィルムにシリコーン樹脂加工を施したものを、幅5mmに切断したものを、上記粘着層をすべて覆うように重ねあわせて貼着した。ついで、上記剥離紙を貼着したフィルムを、所定形状に加工するために、トムソン式打ち抜き型を用いて打ち抜き加工を行い、反射シートを得た。

【0031】

【比較例1】厚さ25 μm のポリエステルフィルムの両面にアクリル系感圧接着剤を、その片面に厚さ50 μm の紙にシリコーン樹脂加工を施した剥離紙を重ね合わせてなる両面テープを用い、この両面テープを、スリッター式切断機を用いて2.5mm幅に切断し、これを実施例で使用した多孔質シートの端部に貼着した。ついで、実施例と同様の打ち抜き加工を行って反射シートを得た。

【0032】つぎに、上記実施例および比較例1の各反射シートの、組み立て作業性および粘着層の精度の測定を行った。

【0033】組み立て作業性は、厚み2.5mmのアクリル樹脂製の導光板を用い、この導光板上に、各反射シ

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ートの剥離紙を剥離除去して重ね合わせて固定する作業を行い、一人の作業員が単位時間当たりに固定加工できた数を比較例1を基準として評価した。

【0034】粘着層の精度は、150mm長さの粘着層の、うねりを含む見かけの最大幅（図2におけるW2）と、うねりを考慮しないときの実際の幅（図2における *

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*W1）とを測定し、その差（W2-W1）で評価した。

【0035】上記組み立て作業性と粘着層の精度との評価結果を、下記の表1に示す。

【0036】

【表1】

	組み立て作業性	粘着層の精度 (mm)
実施例	1.8	0.1
比較例1	1	0.4

【0037】上記表1から、実施例では、単位時間当たりの組み立て個数が多く、作業性が向上していることがわかる。なお、この組み立て作業の際、実施例では剥離紙の除去が極めて容易であったのに対し、比較例1では、その除去が困難であった。また、実施例では、粘着層の精度も比較例1に比べて向上していることがわかる。

【0038】

【比較例2】両面テープの切断幅を1.5mmとし、他は比較例1と同様にして反射シートを得ようと試みた。しかしながら、切断幅が狭すぎて、両面テープの切断時に、巻きずれやシート切れが発生し、1.5mm幅で精度よく切断加工した両面テープを得ることができず、結果的に、粘着層の幅が狭い反射シートを得ることができなかった。これに対し、上述のように、実施例では、幅

1.5mmの粘着層の幅が狭い反射シートが得られている。

【図面の簡単な説明】

【図1】本発明の面光源装置用シート部材を示す断面図である。

【図2】本発明の面光源装置用シート部材を示す説明図である。

【図3】面光源装置を示す断面図である。

【符号の説明】

10 シート部材

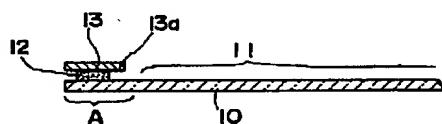
11 有効面部分

12 粘着層

13 剥離紙

A 端部側の部分

【図1】



10: シート部材

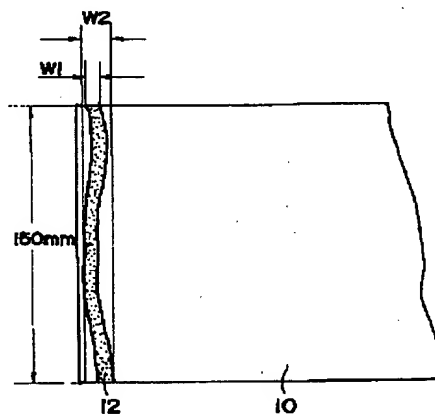
11: 有効面部分

12: 粘着層

13: 剥離紙

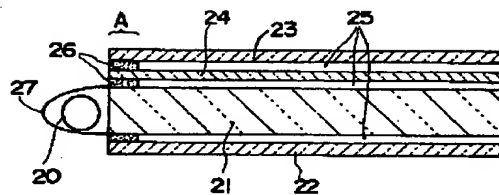
A: 端部側の部分

【図2】



(6)

【図3】



フロントページの続き

(51) Int. Cl. 6

G 0 2 F 1/1335

G 0 9 F 9/00

識別記号

5 3 0

3 3 6

庁内整理番号

F I

G 0 2 F 1/1335

G 0 9 F 9/00

技術表示箇所

5 3 0

3 3 6 J